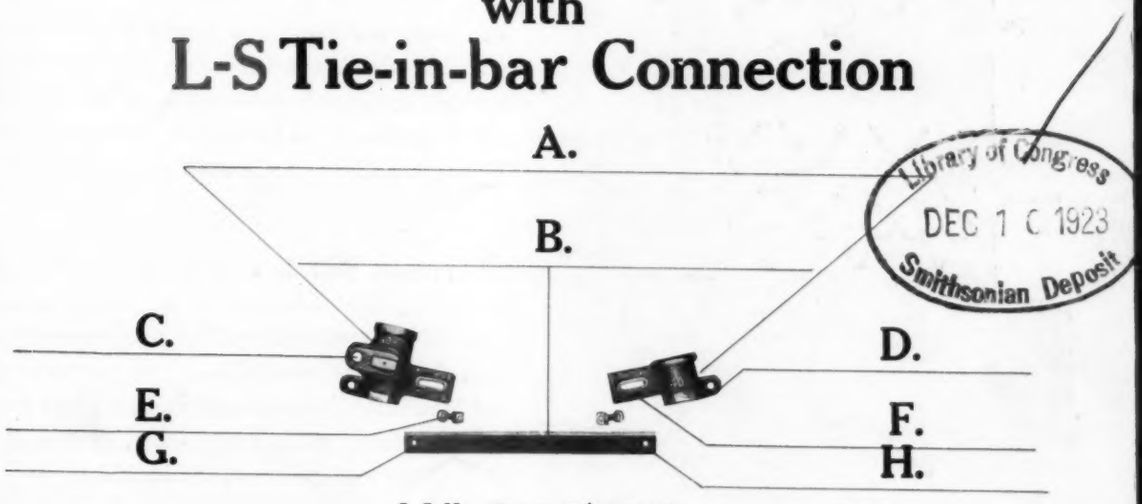
American
GAS JOURNAL
Formerly American Gas Light Journal
EST. 1859

VOL. 119. No. 27.
WHOLE NO. 3439.

NEW YORK, SATURDAY, DECEMBER 8, 1923

Subscription $3 per year
In Canada $4 In Foreign

Simplicity and Service with L-S Tie-in-bar Connection



L-S No. 45 connection apart

A. Inlet and outlet members take the place of ordinary fittings.

B. Members are held together by tie-in bar which can be twisted slightly with a wrench yet when put into service will take care of ordinary strains common to meter setting.

C. Iron body brass core lock wing stop cock built into inlet end.

D. Eyes on each end of the connection take the rods which in turn hold up the meter.

E. Two nuts and bolts when tightened hold the connection rigid.

F. Slot in the arm of each part of the connection allows adjustment for different width meters.

G. Punched holes in the tie-in bar receive the bolts which make the connection rigid.

H. Holes in tie-in bar can be located so that connection is non-adjustable in width.

Samples and prices on request

The Lattimer-Stevens Company

Company Member American Gas Association

72 Yale Avenue **Columbus, Ohio**

New England Representatives:
The Eastern Service Co.
Boston

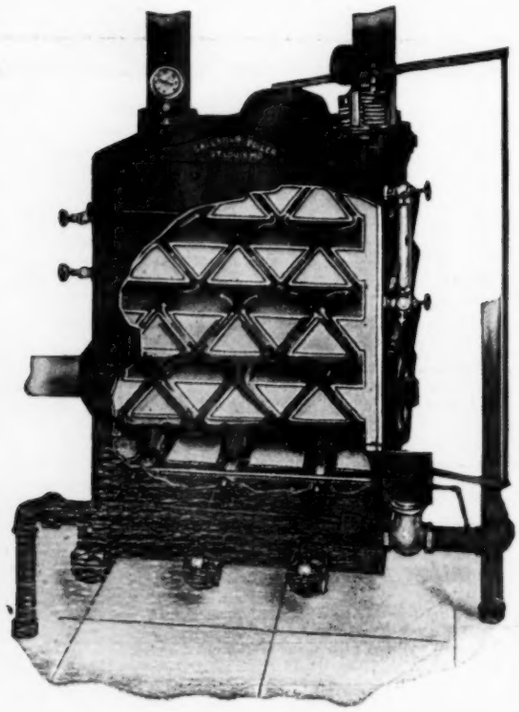
New York Representatives:
Mulcare Engineering Co,
100 Park Place, New York

Pacific Coast Representatives:
Will W. Barnes, Los Angeles
A. P. Bartley, San Francisco

Library of Congress
DEC 1 C 1923
Smithsonian Deposit

Index to Contents, Page 4 Advertising Index, Page 33

Other Gas Companies Are Doing It!



Send for our booklet and terms and learn how Gallaher Gas-Fired Boilers will increase both Volume Sendout and Profit.

TO educate the masses to the convenience, cleanliness, economy, wastelessness, safety and all the other virtues of house heating by gas, will take time and patience; but if the start is not made the goal will never be reached.

Yet there are some gas companies who have approached the house-heating-by-gas problem in an earnest, systematic manner; notably, The Laclede Gas Light Co. of St. Louis, who have surmounted all of the difficulties and whose efforts have been entirely successful.

The present time is most propitious for forcibly presenting the advantages of heating by gas, on account of the unsettled conditions in the coal industry with the possible shortage of this fuel next winter, and householders are therefore in a more receptive mood for improved gas appliances, such as the Gallaher Boiler and Storage Tank Heater.

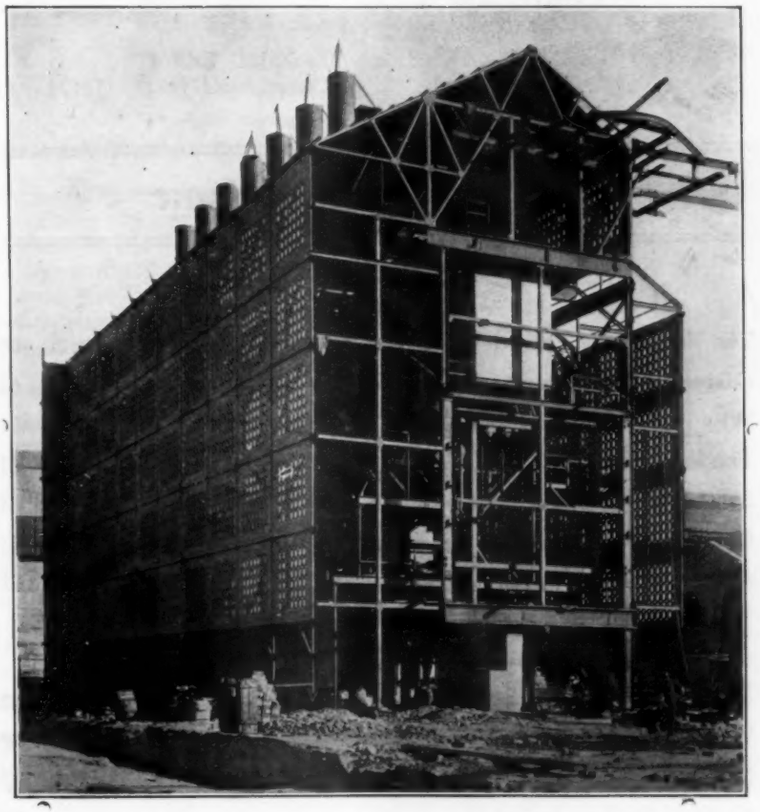
GALLAHER GAS-FIRED TUBULAR BOILERS for Hot Water, Vapor and Steam Heating when shown, lower the sales resistance to this type of house heating and make easy the introduction of gas into a new realm of usefulness; to the satisfaction of the customer and profit of the gas company.

GALLAHER BOILER CO.

Laclede Gas Building, St. Louis, Mo.

GLOVER-WEST
Vertical Retorts

Installed in all parts of the world—Suitable for large and small plants—Maximum results with minimum labor—Ease of regulation of heats and working—Free access to all working parts—Simplicity and strength of construction.



Your selection of a Plant is as important as its operation.
Investigate the Glover-West System.

WEST GAS IMPROVEMENT CO.
of America, Inc.
150 Nassau St. New York

American Gas Journal

SIXTY FIFTH YEAR

Published Weekly by American Gas Light Journal, Inc., 53 Park Place, New York, N. Y.

S. G. KRAKE, Pres. & Treas. C. S. MYERS, Vice-Pres. A. M. GLEASON, Sec'y.

STANTON G. KRAKE, Managing Editor

ISMAR GINSBERG, Technical Editor

Contents of This Issue

The Fuel of the Future—By Ismar Ginsberg **609**
Customer Ownership Has Come to Stay—By Chester L. Lane .. **612**
Why Men Fail in the Gas Business—G. W. Allen **613**
The Real Function of the Gas Employee—By Philip H. Gadsden **615**
Safety Work in By-Product Plants—By F. J. O'Malley **617**
Gas Wrinkles **618**
As the Journal Views It **619**
Gas Men Take Notice
Telling the Truth About the Gas Company
Some Gas Service Definitions **620**
What Home Rule Means—By Don Holbrook **623**
Complete Gasification Process **624**
News of the Gas Industry **625**

Subscription $3.00 per year, including postage, in the United States, Mexico, Cuba, Porto Rico, Hawaii or the Philippines; in Canada, $4.00; foreign, $5.00—Single Copies, 10 cents.

AMERICAN GAS JOURNAL, December 8, 1923. Vol. 119, No. 27. Published weekly by American Gas Light Journal, Inc., New York, N. Y. Entered as second-class matter Jan. 9, 1917, at the post-office at New York, N. Y., under the Act of March 3, 1879.

AMERICAN
GAS JOURNAL

Vol 119. No. 27 NEW YORK, DECEMBER 8, 1923 Whole No. 3439

The Fuel of the Future--What Shall It Be?

VI. Combustion of gas--Recuperation and regeneration of heat

Ismar Ginsberg, B. Sc., Chem. Eng.

IT HAS been shown how the capacity of a furnace and the efficiency of the apparatus, as a heating medium, are dependant on the flame temperature, the rate of flame propagation and the thermal capacity of the fuel that is used in it. But, after all, the most important consideration in studying the efficiency of a fuel, particularly gas, for a definite purpose, is the proportion of the heat generated that is put to useful application. A great amount of heat may be produced in the burning of the fuel, but unless this heat is economically and effectively utilized the mere fact of its generation is of little importance. How much of the generated heat can be actually utilized in performing the function for which it is intended and how much of it goes to waste and is lost in the flue gases are matters that depend more particularly on the construction of the furnace in which the fuel is burned and the use of auxiliary apparatus for increasing the effectiveness of the heat utilization rather than on the character of the fuel itself.

The Effect of the Fuel

However, the character of the fuel is of some importance. If a very high calorific power fuel is used, say natural gas, a great amount of heat will be evolved and the flame temperature will be high. This heat must be utilized before the products of combustion leave the furnace proper and escape into the chimney or stack as flue gas. Whatever goes up the stack is lost, and it makes no difference whether the heat so lost is in the form of potential combustible carbon, in other words, smoke, or in the form of heat units in flue gases from complete combustion, the loss is a loss just the same and in order to secure economy in the heating process this loss must be avoided in some manner.

Temperature of Furnace Gases and Their Relation to Temperature of Heated Body

It is evident that the furnace gases must be of high enough temperature to heat the material under treatment up to the desired temperature. If we are melting brass or steel, this temperature is necessarily high and the flue gases must leave the furnace at a high temperature. There is accordingly a great amount of heat available in this gas, heat that can be and is used to advantage.

It is further evident that when the flame temperature is high, the heat transference must be accomplished within a period of time that is comparatively limited, and it must be more complete than when the temperature of the products of combustion is comparatively low. Thus if the flame temperature is 3,000 degrees F and the body being heated must be kept at 2,500 degrees F, the temperature must drop at the most 500 degrees F, in order for all the available heat to be removed from the heating gases and transferred to the heated body. If the flame temperature is 2,800 degrees F, then only 300 degrees F need be removed from the hot gases.

If the construction of the furnace is the same in both cases, it is clear that when the temperature of the products of combustion is higher a greater amount of heat must be transferred, and if the conditions are such that permit only a certain definite amount of heat to be transmitted from the heating medium to the heated body, then the excess heat in the gases will be manifested by an increased temperature in the flue gases. The principal fact that strikes our attention at this point is that in general industrial heating operations the temperatures required vary from 1,400 degrees F to 2,800 degrees F, which means that at the most 30 to 75 per cent of the heat of combustion is still in the flue gases at the temperature at which they leave the heating chamber.

Forms of Heat Recuperation

It is obviously necessary to use some means for recovering this heat; otherwise the thermal efficiency of the furnace will be very small. In almost every heating process cold materials are introduced into the furnace to be heated, and it accordingly appears logical that some of the waste heat in the flue gases could be employed to good advantage in heating up these cold materials before they enter the furnace. This is one good way of recuperating the heat in the flue gases. Another way is to preheat the air which is used in admixture with the fuel in the case of gas or which is introduced through the bed of fuel on the grate in the case of coal. It is also possible to preheat both the gas and air. After as much heat as possible is removed from the flue gases in this manner, whatever heat still remains in them may be utilized effectively in a waste heat boiler for the generation of steam.

Examples of Heat Recuperation

An example of the first method of heat regeneration is found in the ceramic industry, in which the materials that are to be fired in the kilns are made to pass through a long tunnel, which is heated either directly or through the aid of double walls and fuels by the hot flue gases which come from the combustion chamber of the kilns after they have given up their heat as far as possible to the ceramic ware in the kilns. It is claimed that a saving of from 25 to 60 per cent is effected in this manner.

There are also other industrial processes in which furnaces are used and in which heat recuperation and regeneration are practised. This is paticularly the case in the iron and steel industry, in the manufacture of steel in the regenerative open hearth furnace. Producer gas is the common fuel used in these furnaces, which consist of a reverberatory hearth and two checker-work chambers, one at either end of the same. The products of combustion pass through one of these chambers and heat up the brickwork, so that by the time the second chamber at the other end of the furnace has cooled down, the blast of gas and air may be switched around and caused to pass through the hot regenerative chamber. In this way a good proportion of the heat in the flue gases, which otherwise would be lost, is saved. The blast of air that is used in blowing blast furnaces is also made to pass through chambers heated by the waste gases from the blast furnaces.

Regeneration of Heat Common Practice

There are many other industrial processes in which heat is used and in which heat recovery and regeneration are employed to double and even treble the efficiency of the heating process. Sometimes the fuel is introduced into the furnace on a traveling device which allows the fuel to be heated before it enters the combustion zone. In many plants there are small individually-fired furnaces from which the flue gases cannot be combined and utilized practically, say in the generation of steam. In these cases the principles of recuperation and regeneration must be applied directly to the furnace unit.

High Flame Temperature and Heat Recuperation

Possibly the first reason for the use of heat regenerative systems was the desire to secure a high flame temperature from a comparatively low calorific power fuel. It will be remembered that, as has been shown in a previous article, the preheating of the air used in the combustion of gas resulted in the production of a higher flame temperature. As has been said, producer gas has been used in the manufacture of open hearth steel and inasmuch as a high temperature was necessary for this operation the only way of securing it with producer gas was to preheat the air or both the air and gas before the mixture was burned in the furnace. The fact that heat regeneration was first used for this purpose has led to the general opinion that heat recuperation and regeneration was suitable only to those operations in which a high flame temperature was desirable.

Recuperation Applied to Ordinary Heating Problems

It was, however, found later that these principles could be applied with good results to ordinary heating problems, and it is safe to say that a heating system, which does not include means for recovering the waste heat in the flue gases, is working very inefficiently, no matter how high the combustion efficiency of the gas or the heat transmission efficiency of the furnace may be. The development of heat resistant metallic alloys, which are able to withstand comparative high temperatures, as high as 1,500 to 1,800 degrees F, has made it possible within recent years to build recuperators in which the air used in combustion could be heated tc high temperatures, resulting in a very material improvement in the efficiency of the heating process.

Practical Limit to Heating of Air

It will be recalled that the amount of heat required to heat up a body to a certain temperature depends in part on the specific heat of that body. Thus if we are heating air in a recuperator to a definite temperature, the specific heat of air will be one determinative factor in fixing the time it will take to heat up the air to a definite temperature. The specific heat of the products of combustion, the flue gases, is much greater than that of air, which means that there is a considerably larger quantity of heat units, calories or B. T. u.'s, in these gases, say at 1,500 degrees F, than in the same quantity of air at that temperature. Thus there is much more heat present in the flue gases than in air at any given temperature.

In order to transfer all this heat to the air it would require a considerable heating surface in the heat recuperator. This is not generally an economic advantage and the heating surface of the recuperator must be limited within economic limits. Hence a certain amount of the heat in the flue gases must be lost. In practice it is common to be satisfied with a heat transference from the hot combustion gases to the preheated air to within 300 to 500 degrees F of

the temperature of the former.

Heating the Fuel

It is evident that a good deal of heat can be saved by heating not only the air of combustion, but the gaseous fuel as well. It is generally good practice to heat up the fuel before it is mixed with air or in admixture with air, but good judgment should be used in limiting the heating process so that the fuel itself is not adversely affected by it. In other words, it is perfectly good practice to pre-heat producer gas or blue water gas before burning the fuel in the furnace, but, on the other hand, it would be poor practice to preheat a high calorific power manufactured gas, for the heat is very apt to decompose some of the high B. T. U. gases that are mixed with the gas and cause more harm than good. The decomposition would result in the deposition of carbon, which would be lost as far as its heating value is concerned, and which, furthermore, would stop up the recuperators and interfere with its operation.

Recuperation and Furnace Efficiency

It is clear that heat recuperation utilizes the waste heat of the flue gases in heating up either the product under treatment, the air of combustion or the fuel before they enter the furnace. It may not, however, be exactly clear how this improves the thermal efficiency of the furnace. It has been shown above and in a previous article that the preheating of the air results in the production of a higher flame temperature in the products of combustion. This means that the heating medium will be at a higher temperature in comparison with the material to be heated than if no recuperation were practised. The greater difference in temperature between the heating and heated bodies means a more rapid heat transference from the hotter to the colder body. The fact that the velocity of heat transference is increased connotes a greater furnace efficiency and a greater furnace capacity. Thus the net effect of heat recuperation and regeneration is to increase the furnace efficiency and the furnace capacity.

Example Showing Heat Saved by Recuperation

A couple of examples of heat recuperation will show clearly just what importance this practice possesses in the heating process. For example, let us consider that a heat treatment is being carried out at a temperature of 1950 degrees F with a carburetted water gas, having a thermal capacity of 670 B. T. U. per cubic foot. The products of combustion must leave the furnace at a higher temperature than 1950 degrees F, say at 2000 degrees F at the very minimum. This would indicate very efficient heat transference in the furnace; in other words, a perfectly designed furnace with the proper area of heating surface. Still, according to calculations, there will be 295 B. T. U. of heat per cubic foot of gas burned in the flue gases going up the stack. This, then, means that there are available for useful work the difference between 670 and 295 B. T. U., or only 375 B. T. U.

Now suppose the air was heated up to 1600 degrees F by the waste heat in the flue gases. This can be determined by a simple calculation, when the amount of air required to burn one cubic foot of the gas—which is found to be 5.84 cubic feet per cubic foot of gas by a calculation similar to the one explained in detail in former articles on this subject—the original temperature of the air and the specific heat of the same are known. It is accordingly found that 175 B. T. U. are added to every cubic foot of gas burned. In other words, there are now available 375 plus 175 or 550 B. T. U. to do the work of heating.

This, then, means that it is only necessary to have 375/550 of a cubic foot of gas to do the work in the second case, where the air is preheated, as when there is no heat recuperation. The increased fuel efficiency, brought about by the recuperation of the waste heat in the flue gases, then amounts to 175/550 or 32 per cent.

Preheating Both Air and Gas

Suppose in another case a 157 B. T. U. producer gas is being used for a steel treating operation. It is found that the products of combustion leave the heating chamber at a temperature of 1800 degrees F. At that temperature it is easy to calculate, after first finding the number of cubic feet of combustion gases developed per cubic foot of gas burned and the specific heat of the former, that these gases will contain 80 B. T. U. for every cubic foot of producer gas consumed. This heat will go up the stack unless it is recuperated in some way. The net result is that there is available for useful work only 77 B. T. U., the difference between 157 and 80 B. T. U.

In recuperating the heat both the air and the producer gas are heated up by the waste heat in the flue gases. A temperature of 1400 degrees F is attained. This means that the heat returned to the heating furnace in the preheated air is 31 B. T. U. per cubic foot of the producer gas burned and the heat returned in the preheated gas itself is 35 B. T. U. per cubic foot. Hence there is returned to the furnace and rendered available for useful work an additional 66 B. T. U. per cubic foot of the producer gas. The fuel efficiency is found by dividing 66 by 143, the sum of 77 and 66. The increased fuel economy is 46 per cent.

Analysis of Flue Gases

In the course of our discussion on the combustion of gaseous fuels, it has been mentioned at several points that the composition of the flue gases has a very definite bearing on the combustion and furnace efficiency attained with the fuel. It has been shown that the flame temperature of the fuel depends on the specific heat of the flue gases, which is itself dependent on the various constituents of the latter and

(Continued on page 621)

Customer Ownership Has Come to Stay*

People owning public utilities form barrier against government ownership

Chester L. Lane

IN FIFTY years from now, who will own our utilities? We have just come from an era of private ownership of utility properties—and I sincerely believe that that epoch in our business life has forever passed. We are now face to face with either public—or governmental—ownership. And there is a very great difference between the two. The latter I hold no brief for—it will kill itself. The former, however, is with us to stay. The question is—in what form will it finally resolve itself? Will it be a legal ownership—or a trusteeship? I believe that the activities of several of our large concerns in the past few years have answered this question beyond a shadow of a doubt—and that is legal ownership—or as it is more commonly called—"Customer Ownership."

First, let us consider the customer—for unless he is actually, permanently benefited—customer ownership would surely and utterly fail.

Through customer ownership, the customer is able to invest his money where it will always be under his personal observation. He can see the buildings, wires, cars, and other physical evidences of his investment every day in the week.

As the utilities are under very strict state supervision, it is not necessary for the investor to rely upon his own—or hearsay judgment.

People Have a Legal Voice

Through his stock ownership, the customer—that is, the public—now has a legal voice in the operations of the company that supplies his needs. This will not only tend to cause him to respect the rights of the utility, but to see that every one else does also. This legal ownership gives him a right to protect his investment by the ballot when necessary.

Through the wide distribution of stock that always attends customer ownership, the market for the stock is greatly strengthened and is less liable to violent fluctuations.

This widespread distribution of stock also to a very great extent eliminates the possibility of the formations of "pool," "rings," "freezes," etc., to close the small investor out of his holdings at a loss.

As utility companies are constantly adding new customers, installing additional equipment, etc., it naturally follows that not only is the investor's equity constantly increasing, but the earnings per unit of investment are as rapidly increasing.

It is common knowledge that our towns and cities are rapidly expanding. To meet these additional requirements of light, power and heat, it will be necessary for the utility companies periodically to make additions to their existing properties and to even add many new ones. In this way there will be a constant opportunity for the investor to make new or re-investments as he may wish.

As the customer is making a local investment in a company that is, undoubtedly, already very familiar to his banker, he should have no trouble at all in using his security as collateral for a loan with his local banker.

Many companies have adopted the policy of allowing both the customers' dividends, and service bills, to accumulate for twelve months. Then a balance is struck, and either the service bill is only paid yearly, or a yearly dividend is received, depending on the side of the balance found.

Then there is the savings point of view, the aspect of civic pride and community welfare and a dozen other suggestions might very well be offered.

Several Distinct Advantages

From the utility viewpoint there are several distinct advantages of customer ownership.

Not only does customer ownership broadcast a very personal knowledge of the problems and tribulations of the utility, but it does more than this, for it will create such a clear, favorable understanding of the utility business that a very great deal of the usual unjust discrimination will be eliminated.

Through employee ownership it has been possible in the last few years for several of the larger companies to not only greatly reduce their labor turnover, but to practically eliminate strikes and walkouts.

Possibly the greatest advantage of customer ownership is the creation of a favorable attitude toward the company by the community. One large utility, operating in Kansas, estimates that the good will, derived from customer ownership, and applied in rate work, has paid the cost of the entire customer ownership campaign several times over.

From the viewpoint of the general public we find first, the eliminations of strikes, riots, political fights and the like, in which the public always fares the worst.

Then there is the economic feature of the spending of the dividend money, from customer owner-

(Continued on page 620)

*Delivered before conference of Oklahoma Utilities Association.

Why Men Fail in the Gas Business

The lack of enthusiasm—the fear of rivals—the use of the gas job as a stepping stone to something better

G. W. Allen

Secretary, Canadian Gas Association, Toronto, Ont.

BRADSTREET'S can give you a long list showing why men failed in business, and tell you in so many words that in the writer's country, on the average, fifty-one per cent of business men fail annually because of lack of capital; sixteen per cent because of incompetence; thirteen per cent because of specific local conditions; one per cent because of speculation; one per cent because of extravagance; seven to eight per cent because of fraud; four per cent because of neglect; five per cent because of inexperience; and one per cent because of competition. Nevertheless, there always appears to be something deeper, much deeper than all these that is believed to be the root-cause of so many men failing to make good.

High Percentage of Failures

It is said that statistics prove the often made statement that ninety-five per cent of men that enter business eventually fail, and my observations lead to the belief that about the same percentage of employees in industry eventually fail to make good, and that only the five percenters actually reach the goal that they set out to reach.

What, then, is this deep-seated reason for so many failures?

Real Reason Found in Failure to Give Service

Personally, I believe it is in failing to grasp and to readily appreciate the value of putting into practice a sincere desire to be of service to one's patrons, or employer.

Some may argue and deny that this has anything to do with a business failure, and say that lack of capital, for instance, cannot be offset with ever so much of a sincere desire to be of service to one's patrons. This might be quite true in many cases, but when one thoroughly analyzes all the failures listed from year to year it will be found that most of the men had failed to appreciate, first and foremost, what their obligations were to their creditors and customers. In other words, failed to put into practice the principles involved in the quotation, "He that would be greatest among you, let him be the servant." Ten to one, if they had appreciated their obligations to the people they never would have failed.

The trouble with many so-called business men is that they put self-interest above customer interest, and, blinded by selfishness, fail to appreciate the good will that customer interest brings to them.

Lack of Faith at Bottom of Whole Trouble

Now let us get back to our original subject, "Why Men Fail in the Gas Business." My observations along this line cover employees in almost every department of several large gas companies, and in summing up the reasons why so many fail to make good, I am led to believe that lack of faith, so needed to develop enthusiasm and optimism in the gas industry, is at the bottom of the whole trouble. Without faith it is impossible to be a success in the gas business. A gas company manager or employee who lacks faith in the gas industry is about as much good to the business, as far as successful growth is concerned, as a bucket of tar is to a bull. It does not get him nor the industry anywhere. He is in the same category as a barnacle on a ship's bottom. He hinders the ship's progress.

In conversation with gas company officials, gas association members and employees in gas company properties, as well as others directly or indirectly connected in some form or other with the gas industry, one cannot help but notice the lack of faith exhibited by many as to the future of the business. One has to regret the fact that there are comparatively few enthusiastic enough to put forward their best efforts to assist in developing the business to its fullest extent.

More Faith in Gas Business Necessary

Few young men in the business world generally are apparently casting their eyes towards the gas industry as a possible outlet for their talents. Few in the industry are planning it to be their life's work. In fact, I have found numbers of good, honest employees within the industry who are actually studying at home, or at night schools, for other professions than that of gas. Why should this be so? Why is it that, with all the evidence of the industry's progress before us, we find so comparatively few men who are actually putting forth effort, time and money to further the interests of the gas business?

Lack of Education to Real Standing of Gas Business to Blame

The reason is, I believe, that they have not been, or are not being, taught any better. I believe many of the men higher up in our many gas companies are partly to blame for this condition of things. There are some who appreciate the value of teaching their employees these things and are reaping the rewards

of increased business and prestige, but there are many who have failed to see the necessity of educating their gas workers and advising them of the great strides being made in the gas industry within recent years, and that, too, in spite of itself and its weaknesses. Many managers have failed to illustrate to their employees the opportunities that exist in the gas business for all who are wide awake and alive enough to see them.

One is also led to believe that quite a number of employees of gas companies are in the business through force of circumstances, rather than by choice, and they feel that the gas office, or works, are but stopping-off places, temporary side tracks, until something better shows up.

The Example of the Electrical Industry

Electrical development within recent years may have had much to do with this situation. We can take off our hats to most of the electrical men when it comes to a question of optimism. Here, there and everywhere else, these enterprising go-getters are telling the world all the wonderful things that are being done today in the electrical field. It is electricity here—electricity there, and is it any wonder they get the business? Is it any wonder they get results? Everyone appears to be talking electricity. Most of them use gas, of course, but they claim it is only for a short time, and then they hope to turn over to electricity. That's how millions talk. Even gas consumers have the "bug," as some say, and openly make claims that some day they hope to turn over to electricity. No doubt many a gas company employee is partly to blame for the consumers' attitude in this regard, although if he has had no training in the matter, the blame will have to be placed higher up. If employees do not believe in the future of the gas business, how are they going to express any other feeling than that of pessimism when dealing with gas consumers?

Gas Coming to the Fore as a Fuel

Now there is no need for all this. The gas industry is growing in spite of its weaknesses. The national fuel situation, always to the fore, is forcing thousands to use other fuels than coal; consequently, gas is coming in for its share of attention. In fact, gas is coming to be recognized as a possible solution of many of our domestic and industrial heating problems. I know a number of prominent electrical engineers who already see the light, and openly state their belief that a time is coming when they will have to resort to the formulation of plans, whereby if they are to have enough electrical energy to go round for all future demands for light, industrial motive power and transportation requirements, they will have to hinder the wholesale and extravagant uses to which electricity is now being put. Especially does this apply to the use of electric energy as a heat producer.

Gas to Replace Electricity

This country will require, at its present rate of industrial expansion, far more electrical energy for its industrial power and transportation systems than all its waterfalls and power houses can possibly supply. What will be the result? I believe, as many others do now, that gas will play its part in the solution of the difficulty, and instead of a wholesale use of electricity for domestic heating and industrial heating operations, that gas will come to the rescue. In many situations it is even now being exploited as the most logical fuel for such purposes. Gas is going to play a very important part in hundreds of operations to which electricity is now applied.

The writer was for a number of years in the electrical business and although for the past few years has been actively engaged in the gas business, still he has kept himself fairly well informed on the late progress in the electrical field. Reviewing the situation as a whole, he feels very optimistic over the future of gas, both domestically and industrially.

It is facts like these that should be told to our gas company employees. Every gas manager can give wonderful assistance in work of this kind, and feel in the doing of it that he is helping in the development of an industry that some day, and that in the not too distant future, will, in active co-operation with the electrical industry, be a real power in the domestic and industrial light, heat and power world.

Gas Has No Need to Fear Electricity

No! Gas men need not fear the apparent encroachment of the electrical man. Your town may be full of them, all boosting for electricity for all they are worth, but don't let it bother you, because, if you, as a manager or as an employee of a gas company, are out to give your patrons a square deal, and are manifesting and putting into operation that sincere desire to be of service, as well as keeping abreast of the times through close co-operation with your association, and through careful perusal of the electrical and gas magazines and journals, you need not have any fear of the other fellow. Keep your head above water. Keep insisting on the needs of an up-to-date, efficient plant and distribution system, and keep well posted on what your competitor is doing, but don't worry about him, and you will find there is a lot of truth in the old saying, "An enemy known is half beaten."

Active co-operation between both industries, placing each one where from a national economic standpoint it more logically belongs, we will find will be the only solution of our fuel and power problems.

Note—This is the first of a series of articles by Mr. Allen. Others will follow at intervals.

The Real Function of the Gas Employee*

The united efforts of all gas employees essential to successful business and good public relations

Philip H. Gadsden

Vice-President, United Gas Improvement Co., Philadelphia, Pa.

THE future of gas companies, as of all other public utilities, depends largely upon the character of the relationship which is established with their employees, and upon the extent to which this great agency for keeping the public informed about the utilities' affairs, is utilized.

The gas business, like every other kind of business, is divided broadly into two branches—manufacturing, including distribution, and selling or marketing.

The first, manufacturing, is largely technical and scientific, and calls for the specialized services of the engineer and the chemist. Its processes require a high degree of accuracy and the answer to its problems must be mathematically correct. On account of the technical nature of the work, it must necessarily be under the direction and control of scientifically trained men.

Selling End of Gas Business

The selling end, on the contrary, while it has its rules and policies, is not an exact science, and cannot be conducted by adherence to any rigid or arbitrary formulas. It is the department of every business in which human relationship plays an important part, and where the personality of the salesman has great weight. We gas men have failed to recognize the great importance of the commercial side of our business. We have been so intent upon improving the processes of manufacture and distribution that we have not developed the commercial side as we should. There is no fundamental difference in selling gas from selling any other commodity. The same qualities of salesmanship which have been successful in other lines of business are required in the gas business. The mistake which has frequently been made by us is in attempting to apply the same rigid or technical rules to the selling of the product which have been necessary in the manufacture of it.

Selling the Gas Service

In addition to the actual sale of gas and gas appliances to the individual consumer, the great work before us is to sell our service to the community as a whole. This has come to be known as public relations. This cannot be done by following hard and fast rules. There is no definite or fixed answer to the problem of securing the public good will. It is necessarily a matter of adjustment. A considerable portion of our troubles in the past has been due to the fact that we have insisted upon trying to settle our differences with the public by applying some rigid formula which technically ought to work, but which, because it makes no allowances for the human equation, not only does not work, but frequently aggravates the situation.

Selling Depends on United Action of Entire Body of Employees

While the manufacture and distribution of gas require the services of experts and specialists, the selling—which in its larger sense means establishing and maintaining public relations—depends for its success upon the united action of the entire body of employees. Here no technical questions are involved, but plain, every-day human nature. The end desired can only be accomplished by the enthusiastic co-operation of all employees. It is not a one-man job. It calls for co-operation. Its accomplishment depends upon mass action. To secure such co-operation and united effort, we must first create the proper relationship between the employees and the management. The body of employees must be made to feel that their loyal co-operation is needed for the successful working out of the company's plans; that they have a real part to play; that in addition to their duties as meter readers, fitters, gas makers, bookkeepers, etc., they can be of great assistance in creating a proper relationship between the company and the public. That, in fact, only through a body of enthusiastic employees can the right kind of public relations be established and made lasting.

The public relations of the company open up a tremendous field for the activities of the employees, and, properly understood, must bring about a great and very desirable change in the relationship of the employees to the management. This new concept of the relationship between employees and management will solve many of the problems of our industrial relations.

Closer Relations Between Management and Employees Very Desirable

Many of the efforts heretofore made to bring about closer relations between the management and the employees, while well intended, proceeded upon a wrong theory. The thought underlying many of them was that by doing things for the employees;

*Delivered at the Fifth Annual Convention of the American Gas Association.

by improving their living and social conditions; by various forms of welfare work, the employees would come to appreciate the good intentions of the management, and in return there would spring up a feeling based upon appreciation of benefits conferred. This is not the relationship which I have in mind. We don't want a body of grateful employees. The whole psychology of such a relation is wrong. We want the same kind of feeling throughout our companies as we find in a football team—the keenest kind of friendly emulation in accomplishing the common purpose, and we can have it if we follow the same methods, by impressing upon each member of our organization his relation to the whole body and how essential his work is to the accomplishment of the joint enterprise.

In the sphere of public relations we have found a work for each man and woman in the company, and the inspiring thought about it is that it is the same quality of work which is required of each one, from the president to the office boy. It requires no technical training for the work. There are no artificial or rigid formulas which must be observed. It calls for just those human qualities which characterize every successful salesman—enthusiasm in his work, frankness and truthfulness in discussing the company's affairs, and, above all, the faculty of impressing upon the consumer the desire of the company always to serve his best interests.

Gas Employees Avenue for Conveying Message to Public

We haven't yet worked out the method, the practical means by which to carry the message from the gas company to the public. But I say to you the first avenue of approach is through your own men. Who are the men that come into contact with the public? The people who come into personal touch with the gas consumer? Is it those of us in this room? How many get in touch with the real heads—the executives, managers or department heads? Only the relatively few men or women who have a complaint to make and have been bold and courageous enough to insist on seeing the manager or president. The meter man and complaint men and the fitter have the real touch with the public, and the telephone girl, who can do you more harm in five minutes than you can undo in a year. The bookkeeper, and every man and woman in your employ—each one in addition to their official duties is a source of personal influence in his or her community. Each one goes to some church, I hope; belongs to some little social center of activity. Each one of them is asked innumerable questions by the public about the gas business which we never hear, and to which they may be able to reply intelligently or may not.

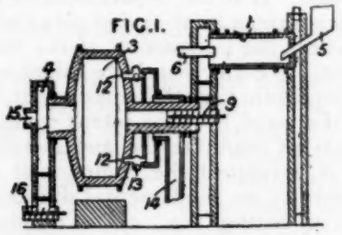
Educate and Inform Employees

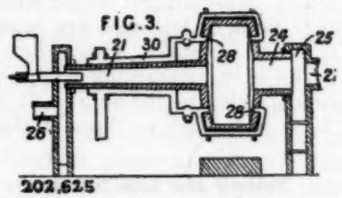
The first thing to do is to educate and inform your own people. Let them realize that the time has come in this industry when this great question of public relations has reached such proportions that it is no longer a one-man job. To do the job right is going to take the united efforts and the zeal and loyalty of every man and woman in the company, and we are depending on them—their job is just as essential as the president's job. They are called on to do something for the community and the company which they can do better than the president can.

Such a policy will not only earn the sympathy and understanding of the public, which must be the objective of all our efforts, but will change the whole basis of our relationship to our employees. They will no longer look upon themselves as merely holders of jobs, but will be inspired by the thought that they have an essential part to play in working out the problems of the company. They will be thrilled by the assurance of comradeship in a joint enterprise. They will take pardonable pride in explaining the problems of the company and justifying its acts to those with whom they come in contact. In their own eyes and the eyes of their acquaintances their jobs become more desirable because more important. Such a policy dignifies the job and democratizes the company.

MAKING GAS IN OSCILLATING RETORTS

Coal, shale, peat or wood is treated in a series of oscillating horizontal or inclined retorts by contact with hot gases, partial combustion, or external heating. The products are withdrawn at each stage of distillation. The material is fed from a hopper 5 to a rotary drier 1, and then by a worm 9 to a rotary retort 3. Hot gas is admitted to the retort through tuyeres 12, and the distillate is drawn off through a





202,625

chamber 4 and outlet 15. Semicoke is withdrawn by a worm 16. In a modified apparatus, the feeding conduit 21 is relatively long, and is surrounded by a jacket 30 for preheating the air supply to the retort. The distillate is drawn off through outlets 26, 27, and the residue passes into a chamber 25. Alternatively, the retort may be heated electrically. Iron ore may be added to fix the sulphur content, and a chloride to convert the nitrogen into ammonium chloride. This process is patented in British Patent No. 202,625.

Safety Work in By-Product Plants*

How hazards are eliminated

F. J. O'Malley

Supt. Geneva Gas Plant, Empire Gas & Electric Co., Geneva, N. Y.

THE elimination of hazards in by-product plants is a subject that is of much interest to all of us, because it is a subject that affects men, and man-power is not only vital to our industry, but to society as well.

Mr. H. O. Palmer, vice-president of our company, recently stated that any man in our business of Public Utility with any kind of a responsible position should be a better man than a man in a comparable position with any other industry, and I believe that he is right. Such a condition is made possible by education and experience. Elimination of hazards is applicable in the same manner. You know that of all the accidents that happen the larger percentage could be avoided if people did some real thinking in time, and thinking, as we know, is the hardest thing for some people to do.

Viewpoint of Management Important

The viewpoint of the management is highly important. To be permanently successful it must think, act, and show by example in and out of working hours its worthiness of having the confidence and best interests of its men at heart—the men must believe in it. The management is responsible for the thinking processes of its employees.

It is my opinion that the elimination of hazards should start early, when the man is employed, and the matter kept fresh in his mind. In this respect it is much like advertising, as it must be done until the man is thoroughly sold, and at the same time having in mind that no sale is entirely satisfactory until all concerned are satisfied, that that which has been acquired is of value for the price paid. If the price of freedom from accidents is education, let us have that proper education.

There Must Be Interest Shown in Safety Work

In connection with this same thought there is another important matter that we know to be true and should be given the attention it deserves. We know that if a person is to be successful in accomplishing something that the first requirement is that of interest. He must be interested in it, and there are many reasons why any one should become highly interested in this subject, both from an employer and an employee standpoint.

We who operate by-product plants know that the industry has made vast strides forward, and is among the most important, producing as it does necessities on a large scale that have become highly important in the progress and development, not of one class, but all classes of people. An industry like ours must be solidly built, and man-power, which is the most important power, must be trained and safeguarded in every possible way.

Hazards Removed by Putting Right Man in Right Place

It has always been my opinion that to put the right man in the right place works wonders in accomplishment, and likewise in the elimination of hazards, and I believe that it is one of the biggest things that can be done for the man. If a man does not like the kind of work that he is doing, he is a misfit. Imagine a man in this position and see how much interest he has in himself and what is going on about him. He becomes mentally and physically lazy. He is one of those men who, if you talk safety to him or show him a safety bulletin, becomes bored. He may agree with you, but he goes on taking the same old chances. A good many times much can be done to help this man find himself by placing him in more adaptable work in which he can become interested. If this cannot be done, we are doing him a service to tell him so, and allow him to find employment elsewhere.

The Single-Track Mind Man Most Found on Accident Lists

The man who is frequently found in the accident list is the one with the single-track mind. His particular line of thought varies with the individual. His mind is not on his job. He may be worrying about his family or thinking of what he did last night, or what he is going to do tonight, or of a multitude of other things. He is engaged in doing work that requires his thought and attention, and his thoughts are far from it. He does not pay attention to Safety First Rules, because his mind is filled with other things. He is wandering away mentally, and he is a bad risk.

As previously stated, in our industry we want real men, men who appreciate that right living and right thinking pay big dividends in good health, which is essential. A man of this type who is interested and satisfied with his work is filled with a spirit of contentment, but not that of satiety, and his name is seldom found in the list of accidents.

It is appreciated that many times when men are wanted we cannot get a man made to order, and this

(Continued on page 620)

*Abridged from an address delivered at the Twelfth Annual Congress of the National Safety Council.

GAS WRINKLES

The Gas Wrinkles, which will appear each week until further notice, are taken from a report compiled under the direction of M. R. Thompson and delivered at the 1923 meeting of the Pacific Coast Gas Association.

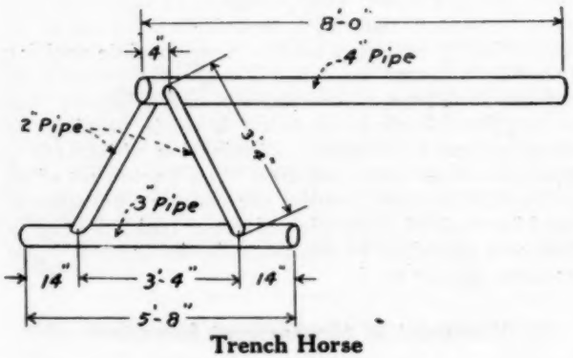
PIPE TURNING IRON AND TRENCH HORSE

O. J. Osborn, Long Branch, Calif.

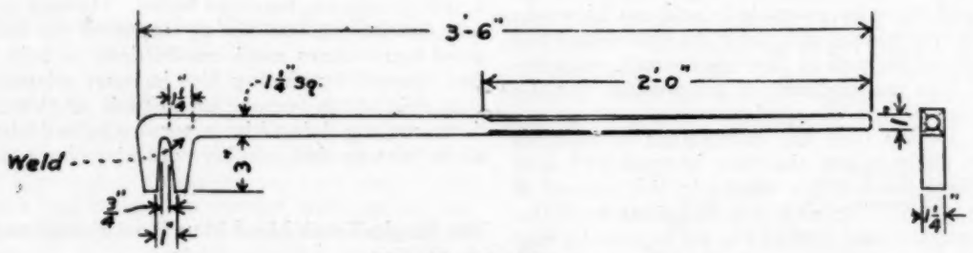
These two pieces of equipment are used in connection with the installation of pipe lines, the turning iron being used for rolling plain end pipe while lining up, welding and applying protective coating.

The trench horse is used for lowering the pipe into the trench, one end being supported on a bank of earth thrown out of the trench.

The pictures show these devices in use and the accompanying drawing shows the details.



Trench Horse



Pipe Turning Iron

Using the Trench Horse

Using the Pipe Turning Iron

As The Journal Views It

GAS MEN TAKE NOTICE

The American Gas Journal is going to afford each and every gas man in the country an opportunity of acquiring a copy of the best and most widely used book on American Gas Practice, through its columns.

The book, entltled "Catechism of Central Station Gas Engineering," needs no introduction to the older gas men. It is a collection of questions and answers, prepared by an educational committee, on every conceivable topic relating to the manufacture, testing, distribution and use of gas. It is the standard text-book on American Gas Practice and has been more extensively used by gas men than any other hand-book.

Some of the older gas men and practically all the younger men have been unable to secure a copy of this book, for it has long been out of print. The inquiries as to how, where and when this book could be acquired, that the American Gas Journal has constantly been receiving, was clear evidence of the popularity of the book and desire of many gas men to obtain a copy of it. Its value is plainly substantiated by the use to which it has been put. It has been and still is the veritable "Bible" of the American Gas Industry.

Accordingly, the readers of the Journal will find, commencing with the first issue of the paper in January, 1924, four pages set aside especially for the reprinting of this book verbatim. Every issue will contain an installment until the book has entirely been published. It will appear just as it was originally written. Nothing will be added or removed.

The American Gas Journal has deemed it a duty it owed to the gas men of the country to present this opportunity to them. It wants them to know that such an opportunity now offers itself, so that they may take advantage of it.

TELLING THE TRUTH ABOUT THE GAS COMPANY

Newspapers, as a rule, play politics, and it has been their habit in the past to broadcast speeches and articles unfavorable to gas and other public utility companies. The speeches and articles are prepared by men running for office, men who want a seat at the city or country pie counter. "I'll make the water, gas and electric company reduce its rates," has for years been a "sure-fire" applause and vote getter for these petty politicians.

It is most gratifying, therefore, to find a newspaper whose editor is smart enough to see through this old, time-worn dodge, an editor big and broad enough to devote several columns in his paper to telling his readers the real truth about conditions and to seeing that justice is done—a friend and an upbuilder of his community.

Under the heading, "USING THE GAS COMPANY FOR POLITICAL BUNK AND FEES," the "Citizen-Sentinel," Ossining, N. Y., of October 15, printed a most excellent article, parts of which we herewith quote:

"The Citizen-Sentinel is just as desirous as anybody for lower rates on gas and electricity. We are rather large consumers for a small concern. We have five motors running practically eight hours a day, and as many gas and electric lights as the ordinary business. We do know, however, that we get real service from the company.

"Compared with the prices paid for every other article used in the production of a newspaper, the gas and electric rates are the only things which have not advanced.

"As the political days approach the professional politicians look upon the gas company as a legitimate prey for political buncombe.

"We find the legal lights of the local Barlow Boomers assaulting the gas company, for political purposes, and a chance for more legal fees. * * *

"The Northern Westchester Lighting Company renders 24-hour service and it has employees continually looking after the service to see that it is rendered continuously. * * *

"Since the company has been organized it has made extension of property costing thousands of dollars, built up the surrounding territory and brought people who have made homes in which to live and thereby increased not only the population, but has brought trade to the merchants. Therefore this company has worked as an economic good to the territory in which it renders service. * * *

"It is one of the highest taxpayers in the several localities in which it operates and contributes thereby to the benefit of all taxpayers concerned. * * *

"What a fine town we would be now if we did not have a progressive public service corporation to supply light and power at reasonable and just rates! * * *

"The buncombe of the legal light, just for little fees, is bad enough. For men who claim to be progressive officials to stand for this bunk shows how the Barlow Boosters are slipping in another direction also."

If we had a few more editors like the man who wrote the above article scattered throughout this broad land of ours, it would not be long before the public utilities companies would get a square deal, which is all they want. More power to him.

SAFETY WORK IN BY-PRODUCT PLANTS

(Continued from page 617)

condition of the right man for the job cannot be accomplished in a day. It may take some time, but it is of sufficient importance to keep in mind, so that eventually it may be accomplished.

Foreman and Department Heads Must Be Sold on Safety

Foremen and department heads form an important part of the safety organization, and these men must be thoroughly sold on the idea of safety. In many respects they are the company.

(This address concludes with a set of safety rules, which covers several pages and which cannot accordingly be published here for want of space. However, it is our intention to publish this set of rules in weekly installments, commencing with our next issue.—The Editor.)

CUSTOMER OWNERSHIP HAS COME TO STAY

(Continued from page 612)

ship, at home. And this is no inconsiderable amount of money.

By making the utility a citizen, there is a tendency toward a rapid development of civic pride, prosperity and peaceful advancement.

Yes, customer ownership is with us, and will be with us for some time to come. Our friends, the "red," the "socialist" and the "anarchist," claim that they desire "public ownership." When one of our largest corporations has over 100,000 shareholders, that is, is owned by 100,000 individuals, then I ask you—have we not in truth public ownership at our very door?

SOME GAS SERVICE DEFINITIONS

Employees of Empire Companies Submit Several Excellent Ones in Recent Contest

That employees of the distributing departments of the gas division of the Empire Companies know the meaning of gas service is shown in definitions offered by them in a recent contest conducted by this division. Several excellent definitions were handed in and they follow, with the names of the winners:

A. J. Nagel, local manager of the Western Distributing Company, El Dorado, Kans., says gas service is "the constant effort to render immediate and satisfactory attention to all the requirements of the customer, pertaining to the distribution and use of natural gas."

George Paxton, gas engineer, Arkansas Valley Gas Company, Arkansas City, Kans., offers the following as a definition for gas service: "Use up-to-date methods, practice the golden rule, and make sure that the consumer is getting what he is paying for and that he fully realizes it."

"Giving the customers what they want and when they want it with kind and courteous treatment at all times," is the definition made by W. E. Carden, new business manager, Western Distributing Company, El Dorado, Kans.

Members of the distributing department who received honorable mention in the contest and definitions offered by them are:

L. T. Tomlinton, meter reader at Arkansas City, Kans.:

Gas service, I will say,
Is, treat every one in the same way,
If lots of gas he should demand,
Always have the gas at hand,
And likewise if the use be small
Always have the gas at call.
If the line is to be laid anew,
Get right on it with a full crew,
Or if a line should chance to burst,
Always have someone to trust,
And fix the line by night or day,
For someone wants the gas, I'll say.

Frank A. Hearle, local manager, Arkansas Valley Gas Company, Arkansas City, Kansas:

"Courtesy, honesty, good judgment, carefulness, good salesmanship, highest possible efficiency and promptness in the performance of all of our duties in serving the public."

C. F. Drake, local manager, Western Oklahoma Gas and Fuel Company, Duncan, Okla.:

"Efficiency of production, transportation and distribution of the commodity that results in the consumption of same by the consumer in competition with all other fuels."

FUEL OF THE FUTURE

(Continued from page 611)

the percentage volume or weight of these constituents present therein. Then, again, the composition of the flue gases is important in telling the investigator whether or not his fuel is being completely burned. For example, the presence of carbon monoxide in the flue gases means a direct loss of heat, for carbon monoxide is only an intermediate product in the burning of gases containing carbon, such as methane and ethylene, and if the original gas contains carbon monoxide, as it generally will, it indicates that this constituent has not been completely burned.

Important to Know Composition of Flue Gases

It is then clearly an important matter to know the composition of the flue gases and it may not be out of place to say a few words about this matter at this point in our discussion. The gases of combustion usually consist of carbon dioxide, water vapor, nitrogen and sometimes sulphur dioxide, or perhaps sulphuretted hydrogen, when the original fuel or gas contains sulphur compounds. Usually this sulphur compound is in the form of sulphuretted hydrogen, which when burned yields water vapor and sulphur dioxide.

It is an easy matter to calculate the carbon dioxide that will be obtained from burning a fuel (gas) with just the proper amount of air required for combustion. The first thing to do is to find the volume of the products resulting from the combustion of one cubic foot of the gas by using the chemical equations representing the combustion of the different constituents of the gas. Then, when the total volume of these combustion products are known, neglecting water vapor—for when the gas is analyzed, the water vapor will condense as the gas analysis is carried out below 212 degrees F—this volume is divided into the volume of carbon dioxide present in the gases.

Example of Calculation

For example, it is known that every volume of carbon monoxide that is burned will give one volume of carbon dioxide. Hence if the gas contained 50 per cent carbon monoxide, 0.5 cubic foot of carbon dioxide will be produced for every cubic foot of the gas burned. If the remainder of the gas were made up of 50 per cent hydrogen, in other words, if we are considering a blue water gas, then the hydrogen will burn to water, giving likewise 0.5 cubic foot of water vapor per cubic foot of gas burned. The consumption of oxygen will in each case be half the volume of the original constituent of the water gas, thus 0.25 cubic foot for carbon monoxide and 0.25 cubic foot for hydrogen per cubic foot of the original gas. The total volume of oxygen is therefore 0.5 cubic foot, which means that the nitrogen is 0.5x3.78, or 1.98 cubic feet of nitrogen per cubic foot of water gas. The total volume will then be 0.5+1.98, or 2.48 cubic feet per cubic foot of original gas. The percentage of carbon dioxide in the products of combustion will then be 0.5/2.48, or 20.9 per cent.

This calculation gives us an idea of how much carbon dioxide is to be expected in the flue gases. Then if the actual analysis of the flue gases showed this percentage of carbon dioxide in the flue gases, we would know that the fuel is being completely burned without excess of air. If the percentage of carbon dioxide were low and if at the same time we found that the flue gases contained an excess of oxygen and no carbon monoxide, we would know that the gas is being burned with too much air. The burning of gas with too much air is detrimental to furnace efficiency, for it means that a larger volume of air must be heated up and heat is thus lost. Furthermore, it means an increased volume of flue gases which also connotes heat loss.

Factors Influencing Furnace Efficiency

In considering any heating problem from the thermal angle, it must be remembered that the principal point is how effectively is the fuel being used for the purpose. Gas is a fuel that can be used for every purpose in which heat is required, but the highest efficiency and in fact just good economy can only be obtained by taking into careful consideration the various factors that affect the efficiency of its utilization. The effect that it is desired to obtain with the fuel must also be given attention, for different construction of burner, different fuel mixtures and compositions will necessarily have to be chosen for different purposes.

In summing up what has been said before, the efficiency of the utilization of gas as a fuel may be defined as being dependent on three factors, the heat units contained in a cubic foot of flue gases, the theoretical temperature of combustion and the rate of flame propagation. A fuel that has a relatively high utilization efficiency must necessarily have a relatively high concentration of heat units in each cubic foot of gases of combustions, a high flame temperature and a high rate of flame propagation. It has been mentioned above that high concentration of heat units in the gaseous products of combustion generally means high flame temperature, and this in turn signifies that the heat transference from the heating medium to the heated body is rapid and efficient.

Rate of Flame Propagation and Its Importance

But it must also be remembered that a high concentration of heat units in the flue gases does not in itself mean that the flame temperature will be high. There is still another factor that enters into the phenomenon and that is the rate of flame propagation. It is entirely possible to have a high thermal value gas, a gas that possesses 600 to 700 B. T. U. of heat per cubic foot, and still be unable to secure as high a flame temperature with this gas as with another of lower thermal value, but containing those constituents which have a high rate of flame propagation.

Analogy of the Waterfall

What the whole thing means is just this: If we use the analogy of the waterfall, we can imagine a steady flow of water over the fall producing a certain energy effect at the bottom. This energy effect may be comparatively small, because the flow of water over the fall is spread over a long period of time. But if all the water would suddenly come over the falls in an instant of time or in a comparatively short time period, then the energy effect would be enormous.

It is somewhat similar in the case of burning gas. If all the heat is generated within a short time, the temperature is exceedingly high, for the rate of flame propagation is rapid, but when the latter rate is low, then the heat is generated over a longer period of time and the temperature is not raised to so high a point, because of the dissipation of the heat during its comparatively slow evolution. Then, again, slow flame propagation means a long flame and a correspondingly greater loss of heat due to radiation.

Dilution of the Gas With Air Before Burning

The dilution of the gaseous fuel before burning is an essential process in the combustion of the fuel. It is of the utmost importance that neither too much nor too little air be mixed with the gas. Too much air means that the rate of flame propagation, the thermal units in a cubic foot of combustion gases and the flame temperature of the same are reduced. If too little air is used, then there is insufficient oxygen provided for complete combustion of the gas and heat loss is entailed in the unburned portion going up the stack.

Gas possesses a very great advantage over all the other fuels in that it can be burned with very little or no excess of air. In other words, it is possible to mix the gas with almost the exact amount of air, theoretically calculated to be required for complete combustion. This is only possible, however, when the principles of combustion are correctly applied to the design of the equipment and burners and when the proper quality of gas is employed so that the maximum heating can be obtained in the minimum time. The use of the blast burner gives good results because the rate of flame propagation is so greatly increased in this burner.

Composition of the Gas and Rate of Propagation

The proportion of various constituents in the gas have an important effect on the efficiency of utilization of the fuel. Thus, when the gas contains a large amount of inert constituents, such as nitrogen in the case of producer gas, the rate of flame propagation is sluggish and the flame temperature of the products of combustion is low. Every commercial gaseous fuel contains some nitrogen, water vapor and other inert ingredients, gases which do not burn and do not add anything to the heat value of the gas When the percentage of these ingredients is low, say between 5 and 15 per cent, so that not enough of them is present to seriously lower the rate of flame propagation and the flame temperature, their presence is not undesirable.

It must also be remembered that the chemical action of the products of combustion on the substances that are heated is also an important consideration. Generally speaking, it is inadvisable to use a gas which contains appreciable amounts of sulphur, as very harmful effects are produced thereby. Then, again, the presence of a large amount of excess air, hence oxygen, causes oxidation of the metals under treatment, which is also undesirable.

Effect of Artificially Increasing Heat Value of Gas

In many cities where the law sets a high heat value for gas, it is necessary for the gas company to crack gas oils in order to obtain higher hydrocarbons, which possess illuminating power and a high B. T. U. value, and bring the calorific value of the coal gas up to the legal standard. These higher hydrocarbons do not burn with a high rate of flame propagation and hence if the flue gases are cooled down before these slow-burning hydrocarbons have had a chance to burn completely, evidences of incomplete combustion are readily noticeable in the blackened undersurfaces of pots and pans that are being heated. This means a waste of heat. Hence it must be emphasized that efficient heat utilization is not directly proportional to increased concentration of heat units in the gas. As has been mentioned before, there are other factors which must be given due consideration as well.

This brings up the phenomenon which has been observed for some time in the past and which has surprised many gas men, namely, that after the B. T. U. of a gas was reduced, the consumer still used the same quantity of gas as before and obtained the same heating effect. In other words, increased thermal efficiency was obtained in the utilization of the heat by lowering the thermal value of the gas. The explanation of this is easily obtained by the application of the principles of flame temperature and the rate of flame propagation. By removing the sluggish-burning higher hydrocarbons from the gas, which are responsible for its high heat value, the residual gas was able to burn with a greater velocity, the flame temperature was higher, combustion was more perfect and therefore more efficient.

Conclusion

In concluding this article the writer wishes to emphasize the fact that the purpose of the articles of the Fuel of the Future series so far has been to prepare the way for the consideration of gas as a logical, efficient fuel for every purpose in which heat is required. The proper understanding of the fundamental principles of combustion and heat utilization is absolutely essential before any fuel problem can be solved. The salesman or the engineer who approaches a prospective user of gas must know how to apply his fuel to the existing conditions and how to make the necessary calculations to determine the

quantity and the quality of the gas that will give the best results. The principles are elementary and easy to understand. Their application is perhaps a more difficult matter. This is our next task. The use of gas as a fuel for every industrial and domestic purpose.

* * *

(In preparing the last four articles of the Fuel of the Future series, which have been published in the American Gas Journal, the writer was afforded an opportunity of acquiring certain data and information, including tables, methods of calculation, as well as numerical examples, which were used in the preparation of a report on Combustion, recently delivered before the Industrial Gas Section of the American Gas Association at its fifth annual convention. In writing these four articles he has followed in most respects the general arrangement and method of presentation used therein, and he wishes to acknowledge his indebtedness thereto.)

COMPOSITION OF LIGHT OIL FROM CARBURETTED WATER GAS AND OPERATING PRACTICE

This paper reports certain work done in co-operation with the American Gas Association in investigating the relation of the properties of gas oils and the gum forming properties of carburetted water gas. The present report deals with the effects of operating practice on the composition of the light oils from carburetted water gas. It describes in detail the apparatus and method used in making the research and gives detailed tables of results as well as discussions of these tables. Serial No. 2537, Bureau of Mines.

What Home Rule Means

An explanation of the recent Amendment to the New York State Constitution

Don Holbrook

AT THE November election the people of the State of New York voted in favor of an amendment to the State Constitution known as the Home Rule for Cities measure.

Recently former Transit Commissioner Delaney of the New York City Transit Commission is quoted as having remarked: "We will contend that cities are given the right to regulate public utilities within their boundaries. We will press the Walker-Donohue bills at the 1924 session and claim that by the mandate in the amendment itself the Legislature is required to pass them. The only difference will be that they must be State-wide rather than apply only to New York City."

Other authorities are broadcasting the statement that the acceptance of the Home Rule amendment by the people gives each and every municipality the immediate right to regulate utilities located within their boundaries.

Section seven of the amendment itself, the opening sentence states: "The provisions of this article shall not affect any existing provisions of law, but all existing charters and other laws shall continue in force until repealed, amended, modified or superseded in accordance with the provisions of this article."

Legislation Necessary to Put Home Rule Amendment Into Effect

It is entirely clear, therefore, that unless and until the Legislature itself, in accordance with the constitution and law, modifies or amends present public utility statutes, such law will remain in full force and effect, and unless and until the Legislature makes special provision for the application thereof, the new powers conferred upon cities will not be effective. That the Legislature of 1923 had something of this sort in mind is evinced by the fact that it authorized a commission to prepare appropriate legislation to put the Home Rule amendment into effect provided it was approved by the people.

How the Amendment Actually Operates

The exact status of the situation is this: The ratification of the Home Rule amendment by the people restricts the Legislature from the passage of any law affecting just one city of the State except as the Governor recommends such legislation be enacted, and one hundred members of the Assembly and thirty-four members of the Senate vote for its passage. There can be no more passage of local bills relating to one particular city on a mere majority vote of the Legislature; there must be a two-thirds vote and the Governor must first recommend its passage.

This means, in short, if the city of Buffalo wants authority to operate bus lines, if the city of Syracuse would regulate gas and electric companies, if the city of New York would have complete supervision, untrammeled by State control, over the transit situation, the Governor must first recommend such legislation and then two-thirds of the Legislature must concur in its passage.

No Real Gain in Regulation of Utilities

By the adoption of the amendment the Legislature has been deprived of the right to enact local legislation affecting one city or particular cities having certain population by a mere majority vote, and in order to allow Buffalo to operate bus lines must authorize all cities to exercise the same function, but the cities themselves have gained nothing in the

way of regulation of utilities within their boundaries unless existing laws be amended, and special legislation be enacted to enable them to do so.

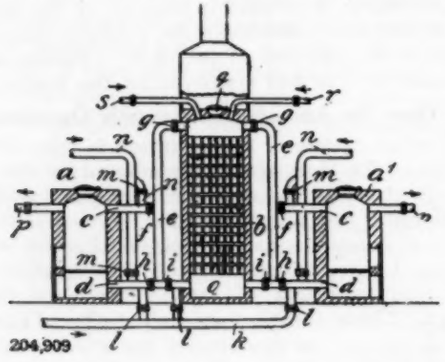
COMPLETE GASIFICATION PROCESS

The object is to effect a complete conversion of bituminous fuel into gas of high calorific value, and also to recover tar. Two gas producers are used in conjunction with a superheater, and these are blown alternately. The superheater is heated by waste gases, fuel is fed to one producer during the blowing period of the other, and steam is injected into the latter after the blowing period. The water gas thus obtained is passed through the superheater, and then to the producer containing the fresh fuel.

Arrangement of Producers

The two producers, "a;" "a¹," are arranged on opposite sides of the superheater "b," and connected to it by pipes "d" at the bottom. The upper ends of the producers are connected to the top of the superheater by pipes "c," "e," having valves "f," "g." The pipes "d" are provided with valves "h," "i," on each side of their connection with the pipes "e." By this arrangement, gas may be passed through the different vessels either upwards or downwards.

In an alternative arrangement this may be effected by the use of two three-way valves or one four-way



valve for each producer, with the appropriate pipe connections. The steam supply pipes "n" are connected to the pipes "c," "d," through control valves "m," so that the steam may be passed in either direction through the producers. Air is supplied through the pipe "k" having branches with valves "l" to either producer, or to the superheater.

Method of Operation.

Both producers are first filled with fuel, which is coked, and air is then blown through the producer "a." The gas passes out through the pipes "c," "e" and valve "i" to the superheater, through which it passes upwards to the atmosphere. Combustion may be completed in the superheater by air from the pipe "k."

During the blowing period of the producer "a" fresh fuel is supplied to the producer "a¹," and steam is then passed through the producer "a" to obtain water gas. This gas is passed into the upper end of the superheater and then downwards through it to the lower part of the producer "a¹." The water gas rises through the layer of coke, and then through the layer of fresh fuel, which is thus distilled. The mixed coal gas and water gas is drawn off through the pipe "p." The water gas from the producer "a" contains some steam towards the end of the process, and this favors the formation of carbon dioxide.

The gaseous mixture is heated in the superheater and the steam is then decomposed in the producer "a¹," and the carbon dioxide converted into carbon monoxide. The temperature in the upper part of the producer "a¹" is not sufficient to decompose the tar vapor evolved from the fresh fuel, and a low-temperature tar is thus obtained. If the temperature of the gas on leaving the superheater is insufficient to maintain the temperature of the producer "a¹," additional air may be supplied to this producer during the gas-making period.

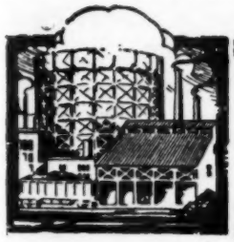
Use of Superheater

The superheater may be used to produce oil gas or oil carburetted water gas, for which purpose oil is sprayed into it through the pipe "r." The gas thus obtained is passed through the second producer, and the gas from the latter may thus have a calorific value equal to or greater than that of coal gas. If coke or anthracite is used instead of bituminous fuel, the waste gases after passing through the superheater may be used for generating steam for the production of the water gas. The plant may thus be used for the production of blue water gas only.—Patented in British Patent No. 204,909.

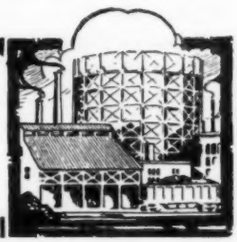
GUMMY GAS METERS

The issuance of Serial 2503, "Some general considerations of the gummy meter problems in the gas industry," by Ralph L. Brown, associate chemist, is announced by the Department of the Interior, through the Bureau of Mines.

The accumulation of gummy and resinous deposits in consumers' gas meters began to assume serious proportions about 1917. As the trouble developed and spread in the years following, it manifested itself in several ways, which ultimately began to be expressible in distinctly economic terms, more specifically in terms of costs. In 1922 an organized and fundamentally based investigation of this trouble was begun by the Bureau of Mines in co-operation with the American Gas Association. This investigation includes two general phases—first, a chemical study of typical gas and gas condensates with regard to their gummy or resinous content, gum-forming constituents, and related subjects; and secondly, a comparative survey of plants affected and unaffected therewith, attention being paid to construction, operation, meter conditions, and related data.



NEWS OF THE GAS INDUSTRY



Durham, N. C., Has Up-to-Date Gas Plant

Durham, N. C.—The Carolina Power and Light Company, which was purchased from the Durham Light and Power Company in 1910, has been improving the plant, equipment and distribution every year and now the plant is capable of producing 3,000,000 feet of gas each day. But the increasing of the capacity of the plant has not affected the service, for the company now gives better service than ever before, it is stated.

In addition to the manufacturing of gas, gas burning apparatus, including gas ranges, gas meters, gas room heaters, gas water heaters and heaters of every description are sold. Everything handled is of the very best grade and has been approved by the American Gas Association.

The rapid success of the Carolina Power and Light Company is due largely to its officers. Among these is Mr. A. W. Grady, secretary-treasurer, who has been with the company for fifteen years, and has built up an office organization of as fine young men as the city affords.

The superintendent and manager of the sales and distribution, Rex O'Briant, has helped to make the service of the company equal to any in the State, while E. C. Damerson, superintendent of distribution of light and power, is always on the job of giving service and restoring the service after rain, wind and sleet storms. He does this in the shortest possible time and is an essential man who heads an important department.

The superintendent of the R. R. department is R. P. Wagner, and he is assisted by Mrs. Otis Rogers, who dispatches orders. Sonnie Thompson, master mechanic, keeps the company going on good schedules and operates more car miles to length of track than any street railway in the State.

Mr. B. N. West, the chief engineer of the power plant, has a record of having had no shut-down at the generating station for over two years. All of the officers of the company are capable men and they have for their slogan "Service."

Finds Romance in the Gas Industry

Los Angeles, Cal.—A great deal has been said about the comfort and beauty of an electric home, but little has been written about the cheer and efficiency of the home equipped with gas throughout. In Southern California, due to the progressive spirit shown by the gas utilities and to the climate, the universal fuel for heating homes has become gas.

There is one bungalow in Los Angeles which is modernly equipped with gas appliances to the Nth degree. This is the little bungalow presided over by Mrs. Taylor Cavin, nee Olive Godfrey, an energetic employee of the Southern Counties Gas Company. Mr. and Mrs. Cavin spent their honeymoon at Del Monte at a time when the recent annual convention of the Pacific Coast Gas Association was in session. Seen by several representatives of the Southern Counties organization, Mrs. Cavin was pointed out for special favors from the several hundred gas delegates taking part in the annual convention of the gas fraternity.

After being featured as the prettiest dancer at the convention, Mrs. Cavin was the recipient of a number of gas burning appliances from several leading gas appliance representatives.

Returning to Los Angeles following the honeymoon, the Cavins immediately installed their gas appliance gifts in their new bungalow.

"I formerly thought that there was no romance in the gas business," said Mrs. Cavin, "but after seeing the activities of the Del Monte convention I am convinced that gas men have plenty of romance. At least, they are very generous gentlemen and I thank them one and all for the good times they afforded us on our honeymoon."

Plans Building

San Francisco, Cal.—A $520,500 construction program was announced by the Pacific Gas and Eelctric Co.

The new sub-station adjacent the present sub-station, Montgomery and Commercial streets, will cost approximately $500,000, according to Henry Bostwick, division manager. The present facilities are taxed to capacity, he said.

Construction of a new wharf at the Potrero gas works is to cost $20,500.

Hugo Tiech Back With Gas Co.

Redlands, Cal.—The Southern California Gas Company has a new manager in Redlands—a new one and an old one, for Hugo Teich returned from Long Beach and was again on the job at the gas company's office. Mr. Tiech was manager of the gas company in the Redlands district for several months, resigning a few weeks ago to go to Long Beach and accept an attractive offer.

While he found his new work satisfactory, Mr. and Mrs. Tiech were not satisfied at the beach town and preferred to live in Redlands, so when he was approached by the officials of the company with an attractive offer for his return here he accepted at once.

Wisconsin Univ. Places Greater Emphasis on Work of Research and Individual Instruction in Public Utility Field

Wisconsin University, the pioneer in public utility courses, has taken another step in front of the procession. Headquarters of the Institute for Research at Madison announces that the institute, in cooperation with Wisconsin University, now proposes to expand the study of public utilities so as to put more emphasis on research and individual instructive work.

The proposed program, Prof. Martin G. Glaeser, of the institute staff, explains, has a three-fold emphasis: A general liberal education; selection of courses which will provide training in method; acquaintance of student with the historical, legal, economic and factual background of the field. Instruction representing greater detail, Prof. Glaeser contends, ends in the direction of vocationalism and should therefore be discouraged.

"Need for a college public utility curriculum," says Prof. Glaeser, "was early recognized by the University of Wisconsin. Special courses in transportation have long been an integral part of its graduate and under-graduate instruction in economics. Coincident with the beginning of State regulation by commissions in 1905, the work was expanded to include instruction in the field of the local public utilities.

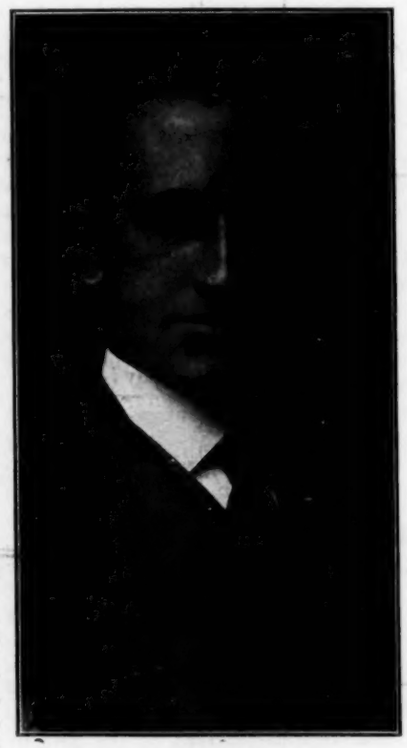
"Graduate work was encouraged for a time by means of special legislative fellowships requiring part-time graduate instruction and part-time employment with the Railroad Commission of Wisconsin.

"If such instruction is to be maintained upon the plane and in accord with the general requirements for university degrees, the major part of the student's four years of undergraduate study will be occupied with getting the fundamentals of a liberal education.

"Within the field of public utilities, opportunity can be given for a comprehensive survey course in the history and regulation of public utilities. This should include the local utilities along with railroads and national utilities generally in order to economize time and be available for those who have no interest in the work beyond its 'public interest' features. This can be followed with special courses in the administration of local utilities and railroads. — Public Service Magazine.

George W. Parker Becomes Vice-President of Parker Russell M. & M. Company

George W. Parker, for eight years vice-president and general manager of the Russell Engineering Co., St. Louis, has resigned from that organization to become vice-president and general manager of the Parker Russell Mining & Mfg. Co., of St. Louis.



George W. Parker

The long-continued illness of Mr. Lemon Parker, president of the Parker Russell organization, and brother of George W. Parker, has prevented him from actively directing the affairs of that organization for some time past. In order to relieve his brother of these responsibilities, George W. Parker has assumed active management of the Parker Russell organization.

Luther Gaston to Manage Plant in Cuba

Spokane, Wash.—Luther Gaston, general manager of the Spokane Gas Company, recently accepted a position as general manager of 12 electric plants in towns adjacent to Havana, Cuba.

Mr. Gaston has just returned from a conference in New York with the owners of the Spokane plant. James Stone, general manager of the electric plant of the Ohio Public Service Corporation at Alliance, Ohio, will be in charge of the Spokane concern, according to Mr. Gaston.

Mr. Gaston has been manager of the Spokane plant since last June, coming here to take the place vacated by Harry Warner, who had been in Spokane for a number of years.

"The large New York companies dealing in public utility properties are rapidly increasing their holdings," said Mr. Gaston. "In fact, there is a concerted movement toward the acquisition of properties of this kind, in the stocks of which the public has in the last year or two shown greater interest. Since my last visit to New York our company has acquired the gas plant at Niagara Falls, four utilities at Charleston, W. Va., and several properties in Georgia, including the gas plant at Athens.

"The use of gas for domestic heating was recognized as the next great field for expansion by gas companies and ours will be in line with the rest. Our plant equipment is capable of producing a great deal more gas than we are now making and with the use of gas for heating homes there is no reason why we should not work to full capacity on business of this kind.

"The Spokane plant has made a great showing in the last year and the Eastern owners believe the business is here and can be had by going after it. That is why they authorized the employment of 14 salesmen, who are to push the use of new gas appliances in this field."

Plans $150,000 Expansion

San Diego, Cal.—The growing demands of San Diego call for greater production of gas, according to Harry H. Jones, president and manager of the Consolidated Gas and Electric Co. As a result the company is spending a large sum on construction equipment.

Request for a permit to construct an additional gas tank, with a capacity of 500,000 feet of gas, to cost $150,000, and to be located in the block bounded by Tenth and Eleventh and L and N streets, has been filed with the City Council. The application also includes a request for permission to erect a tank with a capacity of 83,500 barrels of fuel oil.

A special building permit has been asked that work may start as soon as possible, and the Council will take the matter up at once in conference with the company officials to go over fully and specifically the details of construction.

New Gas System Complete

Frederick, Pa.—Frederick is now equipped with a modern and up-to-date gas generating and distribution system. Improvements towards satisfying a larger demand for gas have been made by the Potomac Public Service Company at the plant on East Church street extended and city mains at a cost of approximately $60,000, said W. C. Humm, superintendent of the H. & F. Railway Co. A large quantity of new machinery had to be obtained and installed and a new holder erected. Owing to the size of the new machinery, the building now housing the gas plant had to be raised another story. The P. P. S. Co. had also laid a new dual gas main system on Market street in connection with the improvements now being made by the city.

Queens Gas Co. Buys Remington Plant

The New York and Queens Electric Light and Power Co. has bought the Remington Typewriter Co.'s plant and grounds at Flushing for the purpose of converting it into a central store yard and distributing station. The price paid is reported to be in the neighborhood of $367,000.

The factory that the Remington people had built on the grounds is to be used by the power company for shop work and not for manufacturing of any kind.

Company Changes Hands

Poteau, Okla.—A deal has been closed here whereby the interests controlling the LeFlore County Gas and Electric Co. takes over the controlling interests of the American Indian Oil and Gas Co., uniting both concerns under one head. However, both companies will retain their titles and maintain separate corporate organizations.

On the first of the coming year the company will maintain one office here and one force of men will do the work.

The LeFlore County organization sold its town rights to the American Indian some time ago and only furnished fuel to a few industrial concerns in town.

This move means more to the town of Poteau than the average person thinks. The LeFlore Company is one of the strongest concerns in the Southwest. The company is composed of men who not only have the ready capital, but they have an unlimited backing, and they propose to see that the people of this town never suffer for domestic fuel. They have thousands of acres under lease and can supply the town for an indefinite time with gas.

The president of the company, Mr. Charles T. Orr, is one of the foremost business men of the Southwest.

The present local management of the LeFlore Company is composed of Messrs. J. B. Millar and B. A. Witte, two gentlemen who understand the business and are ever ready to serve the public in a courteous manner. They will more than likely be local managers of the company when the offices are united.

Gas Service Costs Nation Half as Much as Tobacco

American people spend twice as much in one year for cigars and cigarettes as they do for gas to light and heat their homes, cook their meals and manufacture goods.

Statistics published by the Pennsylvania Public Service Information Committee show, further, that the average gas bill for each customer every month is $2.60. The figures are based upon a study of 9,000,000 consumers in the United States.

The comparison with other expenditures is made with data issued by the United States Government Census of Manufacturers for 1921, the latest available.

Manufactured gas that year sold for $411,195,503.

During the same period the American people spent $7,849,600,000 for food, $2,710,000,000 for clothing, $539,687,000 for furniture, $1,999,914,000 for printed literature, $1,671,387,000 for automobiles, $496,123,000 for tires and inner tubes, $527,259,000 for candies and ice cream, $479,723,000 for butter, $466,600,000 for refined cane sugar, and $806,748,865 for cigars or cigarettes, or nearly twice as much as was spent for gas service.

Cities Service Co.'s Financial Statement

The gross earnings of Cities Service Co. for the twelve months ending with October 31, 1923, were $16,592,772, as compared with $14,558,623 in the corresponding period of the preceding year, according to the monthly statement of earnings issued by the company. In the same period net earnings amounted to $16,077,141, which compared with $14,123,421, and net to common stock and reserves was $8,477,409, which compared with $6,952,014 in the preceding twelve months. This was the equivalent of $18.25 a share earned on the average amount of common stock outstanding. In the preceding twelve months $14.94 a share was earned on the common stock. Preferred dividends were earned 2.70 times as compared with 2.41 times in the preceding year. In the month of October gross earnings totalled $1,049,915, which compared with $1,025,587 in September. Net was $1,011,711 against $991,707 and net to common stock and reserves was $376,110 against $356,380 in September.

Newspaper Boosts Gas Company

The following item appeared in the Augusta, Ga., "Herald":

"Very few people give thought to the tremendous amount of labor necessary, the large amount of capital outlay or the increasing vigilance necessary that they might enjoy the comforts of gas lighting and heating. But such outlay of money, labor, time and vigilance are necessary and are being made every hour of the running twenty-four.

"The compass of the story will not allow of going into minute detail as to the making of gas, the men employed, the fuel burned, the outlay of money involved, and a thousand and one other matters incidental to the gas making and supplying for the city, but a few items connected with the industry in Augusta are interesting.

"In addition to the splendid office quarters occupied by the Gas Light Company of Augusta, at 851 Broad street, and the excellent force of employees at this point, the manufacturing plant of the company on Eighth street covers an approximate acreage of three to five acres. There are three immense gas containers at the plant, with a capacity of 420,000 cubic feet, enabling the plant to manufacture a maximum of about one and a half million cubic feet in twenty-four hours. Sixty-three or more miles of pipe lines, of varying sizes, are necessary to convey the manufactured gas to the nearly 6,000 users throughout the city and on the Hill. The main system of pipe line is able at this time to take care of all adequate needs, and is so arranged that at any time an increased supply for the Hill may be obtained. The pipe system within the past seven months has been largely augmented by installation of pumps and regulators in anticipation of an increased supply to the Hill.

"It is a big job to supply the people with gas for fuel and illuminating purposes, a much bigger job than is considered at first blush. The company aims and constantly strives to at all times give a satisfactory service, and they deem it a favor on the part of patrons to promptly register any cause for complaint. To this end all employees of the company, whether at the manufacturing plant or engaged in the office work or on the street are impressed with the watchword 'Courtesy', and it is safe that every one of them is carefully observant of the teaching.

"One especial feature maintained by the company, in addition to manufacturing and distributing gas, is the employment of Miss Lewis, whose especial duty is to go among the people and show them ways in which to best use gas economically. This department of the company is maintained at no little cost, but it has proven of such value as to have become almost indispensable.

"Any story of the Gas Light Co. of Augusta, no matter how simple, would be incomplete without reference to Joe Hookey, a son of the founder of the Gas Company. Joe has been steadily with the company since his early years, and is perhaps more conversant with the workings of the concern up-one-side-and-down-t'-other than any man or woman at present connected with the plant.

"Marion May, secretary and treasurer, has been with the company for about twenty years, and is thoroughly familiar with all its workings.

"F. L. Marshall, general manager, has been connected with the company in such capacity for a period of eight years, and since coming to make Augusta his home has grown into the deepest and most sincere graces of the people of this city."

Extension Is Being Made in Gas Lines

Wichita Falls, Okla.—The Municipal Gas Company is expending $30,000 in the extension of mains at Wichita Falls, it is announced by H. T. McLaughlin, district manager of the company at that place. When this work and some other contemplated improvements are completed the system will be large enough to serve a population of 100,000. The company now has 6,800 consumers. Among installations planned is a loop system that will give a greater pressure and evenly distribute the gas during periods of heavy consumption.

Decrease in Earnings in October Report

Atlanta, Ga.—The net earnings of the Atlanta Gas Light Company during the month of October were $19,747, compared to $46,358 in September, according to a report of the company filed with the Georgia Public Service Commission. The earnings of the company in October, 1922, were given as $27,470.

The report of the gas company for October was as follows:

Revenues	
From sale of gas	$158,140
From other sources	2,623
Total	$160,763
Expenditures	
Production	$65,840
Transmission, etc.	15,288
Commercial	13,428
New business	4,342
General and miscellaneous.	14,907
Depreciation	10,642
Taxes	16,565
Total	$141,015

Installs New Equipment to Utilize Heavy Oils

The Hyde Park Gas Company of Scranton, Pa., has just ordered from the U. G. I. Contracting Company of Philadelphia a complete heavy oil nebulizing system for all of the carburetted water gas apparatus in the Scranton plant.

By the use of this system the Scranton company will be enabled to utilize heavy oils having large coke content, which otherwise could not be used for gas making purposes.

To Improve Pressure

In order to improve the pressure at the distant points of its system, the Pleasantville (N. J.) Gas Company has contracted with the U. G. I. Contracting Company of Philadelphia to furnish and install a motor driven booster plant, together with the necessary gas connections and building changes. The completion of this booster plant will materially improve the service of the Pleasantville Gas Company.